

PATENT APPLICATION

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REEL MECHANISM

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[1] REEL MECHANISM

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[2] Cross Reference to Related Applications

[3] This application is a continuation-in-part application of application serial number 09/968,952, filed October 1, 2001.

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[4] Field of Invention

[5] This invention relates to gaming devices and, more particularly, to a gaming device that utilizes a plurality of reels in close relative proximity.

15 **[6] Description of Related Art**

[7] Reel-type gaming devices have been used in gaming for more than one hundred years. Traditional reel-type gaming devices have three mechanical reels that rotate around a common horizontal axis. A reel strip is attached around the circumference of each reel and the reel strips display a plurality of symbols. During normal operation, the reels are spun and stopped to display an outcome of the game. As each reel comes to a stop, a symbol on the perimeter of each reel strip is displayed on the front of the gaming device. Some gaming devices indicate a winning outcome by aligning pre-determined symbols on one or more pre-determined pay lines.

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[8] Players of gaming devices typically find it enjoyable to have a variety of different forms of gaming apparatus available. Gaming devices that are more interesting generate more player

excitement and in turn are played longer resulting in more revenue for the game operator. For this purpose, gaming devices of the spinning reel type have been provided with a variety of different graphics, shapes, sound effects, and scoring systems. Some gaming devices have multiple pay lines such as additional horizontal pay lines, diagonal pay lines, and even V-shaped pay lines. The number of reels has increased beyond the basic three reel gaming devices. There
5 are now slot machines with four reels, five reels, and even ten reels.

[9] Gaming devices that display a plurality of partial or fragmented images have also been developed. When predetermined partial images are aligned, the partial images form a single image. Such a gaming device and method is described in co-pending patent application titled
10 Image Alignment Gaming Device and Method, filed on 06/27/2001, with application serial number 09/894,197. In this type of gaming device, it is desirable to position reels closely together so that a player can easily form a whole image when two or more partial images are aligned. If there is a large gap between the reels, the player will have more difficulty forming a whole image from the partial images.

15 [10] However, the prior art has failed to provide reel displays that have relatively small gaps or spaces between the reels. One of the reasons the reels are relatively far apart is that each reel is supported on one side by a chassis and space must be provided between the reels to accommodate the chassis. An example of such prior art gaming devices is disclosed in US patent number 5,580,055 issued to Hagiwara.

20 [11] Thus, a current unmet need exists for a reel mechanism that minimizes the space between the reels. It is also desired that the reel mechanisms use presently available components. A current unmet need also exists for a method of altering existing gaming devices to produce contiguous indicia on their displays.

[12] SUMMARY OF INVENTION

[13] Advantages of the Invention

- 5 [14] The various embodiments of the present invention may, but do not necessarily, achieve one or more of the following advantages:
- [15] provide a reel mechanism that positions reel assemblies close together;
- [16] provide a reel mechanism utilizing presently available components;
- [17] provide a reel mechanism that produces contiguous indicia on the displays of gaming devices;
- 10 [18] provide a method for altering existing gaming devices to produce contiguous indicia on the displays of gaming devices without requiring significant redesigning and tooling;
- [19] allow plurality of reel assemblies to be used to display a whole image from a plurality of partial images;
- 15 [20] allow a new class of designs to be displayed on the displays of gaming devices;
- [21] provide a gaming device that adds to player excitement and satisfaction;
- [22] provide a gaming device that is interesting to a player and results in longer playing time; and
- [23] provide a gaming device that is readily distinguishable from conventional slot machines.
- 20 [24] These and other advantages of the present invention may be realized by reference to the remaining portions of the specification, claims, and abstract.

[25] Brief Description of the Invention

- [26] The present invention comprises a reel mechanism for use with a gaming system that

includes at least one support member and at least a first and second reel assembly attached to the support member. Each reel assembly comprises at least one chassis attached to the support member and at least one reel rotatably attached to the chassis. The reels include a first side and a second side. The first side is attached to the chassis. The reel assemblies include at least one

5 motor coupled to the reel, the motor being configured to rotate the reel. The first and second reel assemblies are positioned side-by-side, the second side of the reel of the first reel assembly is positioned proximate to the second side of the reel of the second reel assembly, thereby allowing the first and second reel assemblies to be positioned without the chassis of the first and second reel assemblies being in-between the first and second reel assemblies.

10 [27] The present invention also comprises a method of producing contiguous indicia on a gaming device. A first and second reel assembly are positioned within a gaming device housing. Each reel assembly comprises at least one chassis and at least one reel rotatably attached to the chassis. The reel comprises a first and a second side, the first side being attached to the chassis. Each reel assembly also includes a motor coupled to the reel and configured to rotate the reel. Each reel assembly also includes a motor coupled to the reel and configured to rotate the reel. The second side of the first reel assembly is adjacent the second side of the second reel assembly, thereby allowing the first and second reel assemblies to be positioned without the chassis of the first and second reel assemblies being in-between the first and second reel assemblies. Indicia are displayed on the reels of the first and second reel assemblies.

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[28] The above description sets forth, rather broadly, the more important features of the present invention so that the detailed description of the preferred embodiment that follows may be better understood and contributions of the present invention to the art may be better appreciated. There are, of course, additional features of the invention that will be described below and will form the subject matter of claims. In this respect, before explaining at least one

preferred embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of the construction and to the arrangement of the components set forth in the following description or as illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it
5 is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

[29] BRIEF DESCRIPTION OF THE DRAWINGS

[30] Figure 1 is substantially an isometric view of a prior art gaming device that utilizes a

5 spinning reel display.

[31] Figure 2 is substantially a side view of a typical prior art reel assembly.

[32] Figure 3 is substantially a side view of a reel with a detached media strip.

[33] Figure 4 is substantially a perspective view of a prior art reel mechanism wherein the reel assemblies are positioned side-by-side on the support member and the chassis of the individual
10 assemblies are in between the reels of the reel assemblies.

[34] Figure 5 is substantially a front elevational front view of one of the embodiments of the present invention.

[35] Figure 6 is substantially a front elevational front view of another embodiment of the present invention.

15 [36] Figure 7 is substantially a detailed elevational view of a portion of the support member in one embodiment of the present invention.

[37] Figure 8 is substantially a front elevational view of another embodiment of the present invention.

20 [38] Figure 9 is substantially a front elevational view of the preferred embodiment of the present invention.

[39] Figure 10 is substantially a front view of a reel display of the present invention.

[40] Figure 11 is substantially a top view of another embodiment of the present invention.

[41] Figure 12 is substantially a front elevation view of an alternate embodiment of the present

invention.

[42] DESCRIPTION OF THE PREFERRED EMBODIMENT

[43] In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings, which form a part of this application. The drawings show, by way of illustration, specific embodiments in which the invention may be practiced. It is to be understood that other embodiments may be utilized and structural changes may be made without departing from the scope of the present invention.

[44] Gaming Device

[45] The present invention comprises a reel mechanism for use with a gaming device. Figure 1 illustrates a prior art reel-type gaming device 20. Gaming device 20 may comprise a case 24, a reel-type game display 22 having a plurality of display sections 34, a handle 26, a currency acceptor 28, a coin bin 30, and a game controller 32.

[46] The display 22 of the gaming device in figure 1 comprises three display sections 34. While display 22 is shown with three display sections, more or less sections may be used. For example, a 3x3 matrix of 9 display sections could be used. A payline (not shown) may be added to the display to aid the player in seeing the alignment of the fractional images. It is noted that display sections 34 of gaming device 20 are spaced apart. This characteristic limits the display capabilities of the gaming device. For example, it is more difficult to use gaming device 20 to display a whole image from a plurality of partial images, the partial images being in different sections 34.

[47] Case 24 contains gaming device components. A wager acceptor 28 accepts wagers from a game player. The wager acceptor may also accept tokens, paper currency, magnetic cards, and

vouchers. A coin bin 30 holds coins that are dispensed after a winning event has occurred. Handle 26 is used by the game player to initiate play on gaming device 20. Handle 26 is pulled by the game player to start the game. Other input devices, such as a button, may also be provided for initiating play.

5 [48] Reels 38 (seen in figure 4) spin or rotate around a common axis. When controller 32 determines that a game-winning event has occurred, the controller causes reels 38 to display the appropriate symbols or indicia 36 in sections 34. The combination or arrangement of symbols 36 corresponds to a display on paytable 40. The player is then awarded a prize.

10 [49] **Reel Assemblies**

[50] Figure 2 shows a prior art reel assembly 60 that may be a large number of reel assemblies that are well known in the art, including S-plus reel assemblies manufactured by International Game Technologies in Reno, Nevada. Reel assembly 60 comprises a chassis 62 and a reel 38 rotatably attached to the chassis. A reel motor 64 may also be provided on chassis 62 for rotating the reel. The reel motor 64 is typically connected to a controller (not shown) to controllably stop the reel rotation. The reel 38 comprises a cylindrical structure with a circumference 66. The reel 38 and chassis 62 are typically made of an injection-molded polymer or steel.

15 [51] Figure 3 shows a reel assembly further comprising a media strip 72 attached to circumference 66. The media strip 72 comprises sections 74 of various types of fractional images.

20 [52] Figure 4 shows a typical prior art reel mechanism having first 80, second 82, and third 84 substantially similar reel assemblies attached side-by-side on a support member 76. The reel

assemblies 80, 82, and 84 are uniformly positioned on support member 76. The support member 76 is typically made of an injection-molded polymer. Alternatively, the support member 76 can be made of steel or wood. Each reel assembly 80, 82, and 84 comprises a reel 38 and a chassis 62. Each reel 38 comprises a first side 70 and a second side 68 with chassis 62 being attached to 5 the second side 68. Chassis 62 of first assembly 80 is positioned between first side 70 of first reel assembly 80 and second side 68 of second reel assembly 82. Chassis 62 of the second assembly 82 is positioned in between first side 70 of the second reel assembly 82 and second side 68 of third assembly 84. Space must be provided between reel assemblies to accommodate 10 chassis 62. This causes reels 38 to be separated from each other by a certain distance. As a result, what a game player sees from the display sections of the gaming device is a series of fractional images that is non-contiguous.

[53] Opposing Reel Assemblies

[54] Figure 5 shows one embodiment of the present invention comprising at least one support member 76 and at least a first reel assembly 80 and second reel assembly 82 attached to the 15 support member. Each reel assembly comprises at least one chassis 62 attached to the support member and at least one reel 38 rotatably attached to the chassis 62. The reel comprises a first side or fastening side 70 and a second side or non-fastening side 68, the first side 70 being attached to the chassis 62. First reel assembly 80 and second reel assembly 82 are positioned 20 side-by-side in an opposing relationship. Second side 68 of reel 38 of the first reel assembly 80 is positioned proximate or adjacent to second side 68 of reel 38 of second reel assembly 82. In the preferred embodiment, the opposing reel assemblies are vertically aligned. In another preferred embodiment, the opposing reel assemblies are horizontally aligned. In other

embodiments, the opposing reel assemblies can be diagonally aligned or aligned other ways.

[55] It is noted that this embodiment configures the reel assemblies so that the chassis of each reel assembly is peripherally positioned rather than centrally positioned between the reel assemblies as in the prior art. As a result, the gap between the reel assemblies is substantially reduced and a player can more easily form a whole image from a plurality of fractional images on different reels. Additionally, the reel configuration allows for more display opportunities. Whole images, such as an image of a person, place, or an object, can be displayed on the gaming device by dividing the whole image into fractional images. When the fractional images from each reel are aligned, the game player will see a contiguous whole image from the display section of the gaming apparatus.

[56] Angularly Supported Reel Assembly

[57] Figure 6 shows another embodiment of the present invention comprising at least one support member 76, a first reel assembly 83 and a second reel assembly 85. Each reel assembly comprises a reel 38 with a first side 70 and a second side 68 and a chassis 62 rotatably attached to the first side 68. In this embodiment, reel assembly 85 is angularly mounted so that a portion of second side 68 of second reel assembly 85 is proximate or adjacent to first side 70 of reel assembly 83. This may also be expressed in terms of axes of rotation. Each reel 38 rotates around an axis. In this embodiment, the axes of rotation are nonparallel. This angular relationship allows chassis 62 of the first reel assembly 83 to be positioned between reels 38. The magnitude of the angle between first reel assembly 83 and second reel assembly 85 depends on the size of the reels and the thickness of chassis 62. In order to minimize the angle and make the angle less noticeable to players, it is desirable to utilize large diameter reels and a narrow

chassis.

[58] Second reel assembly 85 may be angularly supported in a number of different ways. As seen in figures 6 and 7, support member 76 may comprise a first surface 96 and a second surface 98 that are joined by a bent section, the first surface being nonparallel to the second surface.

- 5 First reel assembly 83 is attached to first section 96 and second reel assembly 85 is attached to second section 98, thereby creating a nonparallel relationship between the two reel assemblies. In an alternative embodiment (not shown), two support members may be used that have nonparallel surfaces for mounting the first and second reel assemblies. Referring to figure 8, the present invention may also comprise a wedge 100 mounted between chassis 62 of second reel 10 assembly 85 and support member 76. Referring figure 11, support member 76 may have a substantially planar surface and first and second reel assemblies 83 and 85 are mounted at an angle relative to each other on the surface. In this embodiment, a player would view the reel assemblies from the direction of arrow 77. In the preferred embodiment, the angularly supported reel assemblies are vertically aligned. In another preferred embodiment, the angularly supported reel 15 assemblies are horizontally aligned. In other embodiments, the angularly supported reel assemblies can be diagonally aligned or aligned other ways.

[59] Combined Opposing and Angularly Supported Reel Assemblies

- [60] In the preferred embodiment, as shown in figure 9, the present invention comprises a reel 20 mechanism with three reel assemblies 80, 82, and 84. Each reel assembly comprises a reel 38 with a first side 70, a second side 68 side and a chassis 62 rotatably attached to the first side of the reel. First reel assembly 80 is mounted to support member 76 in an opposing relationship to second reel assembly 82, wherein second side 68 of the first reel assembly is proximate or

adjacent to second side 68 of the second reel assembly. Third reel assembly 84 is angularly supported relative to second reel assembly 82, wherein a portion 94 of first side 70 of second reel assembly 82 is proximate or adjacent to a portion 82 second side 68 of third reel assembly 84. A four reel assembly (not shown) could be added to this embodiment by angularly supporting a reel assembly next to the first side 70 of first reel assembly 80. In the preferred embodiment, the combined opposing and angularly supported reel assemblies are vertically aligned. In another preferred embodiment, the combined opposing and angularly supported reel assemblies are horizontally aligned. In other embodiments, the combined opposing and angularly supported reel assemblies can be diagonally aligned or aligned other ways.

[61] Figure 10 illustrates the reel mechanism of the present invention utilized with a gaming device 120. Gaps 122 between reels 38 are substantially eliminated. A player is able to more easily form a whole image from a plurality of fractional images. Additionally, the preferred embodiment allows for even more display opportunities. Larger, more vivid, and realistic images can be displayed on a gaming device because the preferred embodiment allows for more reel assemblies to be positioned side-by-side. A large image, for instance an image of a person, may be divided into fractional images, which can be printed on the media strips of the individual reels of the plurality of reel assemblies. When the fractional images from each reel are aligned, the game player will see a contiguous whole image from the display section of the gaming apparatus.

[62] Alternate Embodiment

[63] Figure 12 illustrates an alternate embodiment of the present invention. Figure 12 illustrates an actuator 200 that may allow reels 80 and 82 to be positioned close together. Actuating mechanism 200 may selectively position reels 80 and 82. A similar mechanism is disclosed in Applicants' co-pending U.S. application serial number 10/245,625, the disclosure of

which is expressly incorporated by reference.

[64] In the illustrated embodiment, actuating mechanism 200 may have a first stepper motor 212 and a second stepper motor 214. First stepper motor 212 may have a tube 216 that attaches to reel 80. Tube 216 may have a hollow center and may be positioned within a central bore 213 of first stepper motor 212. A bore (not shown) may be made in chassis 62 to allow tube 216 to pass through and engage reel 80.

[65] Second stepper motor 214 may have a shaft 220, which passes through first stepper motor 212 in tube 216 and attaches to reel 82. Reels 80 and 82 may be moved clockwise or counterclockwise and may operate independently of each other.

10 [66] Actuating mechanism 200 may further have at least one positioning system. A portion of tube 216 opposite to the end attached to reel 80 may be attached to first positioning system 218. A second positioning system 222 may be attached to the end of shaft 220 opposite to the shaft end attached to reel 82. First positioning system 218 and second positioning system 222 allow for tracking the position of the shaft and tube. First positioning system 218 and second positioning system 222 may have sensors 224 and 226 that detect rotation and transmit signals that can be used to determine the angular position of reels 80 and 82. A controller (not shown in figure 12) may be in communication with actuating mechanism 200 to selectively position reels 80 and 82.

15 [67] Other positioning systems may be used. For example, reels 80 and 82 may comprise media (not shown) on which images, symbols, or other indicia may appear. An optical sensor may be used to sense one or more images, symbols, or indicia on the media and thereby communicate the positions of reels 80 and 82 to a controller.

20 [68] The present invention is not limited to the mechanism illustrated in figure 12. For example, chassis 62 could be modified or removed altogether. In one embodiment, tube 216 and

shaft 220 may provide support for reels 80 and 82. For example shaft 220 may pass through reel 82 and be appropriately supported at that end. In another embodiment, only one chassis 62 is used to support both reels 80 and 82. Actuating mechanism 200 and reels 80 and 82 may be placed horizontally, vertically, or at an angle.

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[69] CONCLUSION

[70] The present invention solves many problems associated with the prior art and fulfills many currently unmet needs. The present invention provides a reel mechanism that produces contiguous indicia on the displays of gaming devices while utilizing the components present in currently existing reel slot machines. The present invention also provides a method for altering existing gaming devices to produce contiguous indicia on the displays of gaming devices without requiring significant redesigning and tooling. The present invention also allows whole images to be realistically displayed on the displays of gaming devices and the present invention provides a gaming device that adds to player excitement and satisfaction.

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[71] Although the description above contains many specifications, these should not be construed as limiting the scope of the invention but as merely providing illustrations of certain embodiments of this invention. Thus, the scope of the invention should be determined by the appended claims and their legal equivalents rather than by the examples given.

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